



**NATIONAL SCIENCE FOUNDATION
4201 WILSON BOULEVARD
ARLINGTON, VIRGINIA 22230**

Joint Announcement of Opportunities for FY 2003:
Interdisciplinary Training for Undergraduates in Biological and Mathematical Sciences (UBM)

March 2003

Dear Colleague:

The leading edge of research in the biological sciences increasingly makes use of concepts and techniques from the mathematical sciences. Likewise, the mathematical sciences have a long history of developing new concepts from biological problems. Continued progress requires a growing pool of individuals with competences in both these fields.

The Directorate for Biological Sciences (BIO), the Directorate for Education and Human Resources (EHR), and the Division of Mathematical Sciences (DMS) in the Directorate for Mathematics and Physical Sciences (MPS) at the National Science Foundation (NSF) are making available opportunities for the scientific community to enhance interdisciplinary education and training for undergraduates at the intersection of the biological and mathematical sciences. The goal is to stimulate development of a future workforce, including teachers and researchers, that is prepared to work in the increasingly many areas where these two disciplines connect. To that end, we invite supplemental funding requests for projects that intensify undergraduate education at the interface through research experiences and changes in curricula and other educational practices.

We are open to all ideas that accomplish the goal of increasing the number of undergraduates trained in both biological and mathematical sciences. Typical requests might include, but are not limited to, activities such as:

- Joint mentorship of groups of students by biologists and mathematicians;
- Opportunities for hands-on experiences for mixed groups of students, e.g., experimental laboratory or field work for the mathematical sciences students and mathematics/statistics and computing laboratories for biology students¹;
- Exploring development of curricula, course materials, or digital library components;
- International cross-disciplinary research experiences for undergraduates;
- Exploratory research on interdisciplinary teaching and learning for undergraduates; and
- Workshops and other explorations aimed at designing methods to advance interdisciplinary education and training.

¹ Undergraduate students participating in research experiences may receive stipend amounts comparable to those of the Research Experiences for Undergraduates (REU) program and must meet REU citizenship/residency requirements. Requests in response to this letter are expected to go well beyond the typical REU supplemental requests, involving several students for an extended period of time.

All activities should be linked to leading edge research combining the mathematical and biological sciences and to the preparation of students for work in this intersection. We especially encourage activities that include participation of underrepresented groups and students at minority-serving institutions and two-year colleges.

Funding provided during FY 2003 will come from existing programs through supplements to existing awards. Proposals should be submitted to the program managing the award to be supplemented. They might request funds to add a training or education component to a research award or to link an on-going research activity to an award for education, training or infrastructure. Proposals submitted by June 2, 2003 will receive consideration for FY 2003 funding. Proposals received after that date may be held for FY 2004 consideration. To help staff identify proposals submitted in response to this letter, all titles should begin with (UBM) signifying undergraduate biology and mathematics.

Supplemental award amounts will range up to a total of \$100,000 for up to two years. Funding for items **other than stipends for undergraduate research participation** should not exceed 20% of the total amount (over all years) of the award being supplemented. Proposers should provide adequate justification for all budget items, including student stipends, faculty or other salary support, and the cost of travel and supplies.

Internal NSF staff will conduct the review process for these supplemental requests using the standard review criteria of intellectual merit and broader impacts. Proposers should describe clearly the interdisciplinary nature of the activities they propose and the linkage of education and training with research. (See the NSF Grant Proposal Guide for a more complete description of the review criteria.)

Proposers are required to prepare and submit requests for UBM supplements through the FastLane system <http://www.fastlane.nsf.gov>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov.

General questions about this Dear Colleague Letter may be directed to: Dr. Michael Steuerwalt (msteuerw@nsf.gov) in DMS, Dr. Sam Scheiner (sscheine@nsf.gov) in BIO, or Dr. Calvin Williams (cwilliam@nsf.gov) in EHR. For detailed descriptions of relevant programs, please consult the Websites, <http://www.nsf.gov/bio>, <http://www.nsf.gov/ehr> (EHR) and <http://www.nsf.gov/mps/divisions/dms/start.htm> (DMS/MPS). If you have questions concerning specific programs in BIO, EHR, and DMS, please contact program officers listed on the Websites or the relevant program announcement.

There are and will continue to be critical needs for sufficient numbers of people with training in both the biological sciences and the mathematical sciences. Responses to this letter will guide us in developing our plans for programming in future years.

Sincerely,

Mary E. Clutter
Directorate for
Biological Sciences

Judith Ramaley
Directorate for Education
and Human Resources

John B. Hunt
Directorate for Mathematical
and Physical Sciences